

Comments from Prof. Ajay Chandak, India.

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- a. In my opinion technologies to be included are solar box cookers above 0.2 sqm of aperture area and parabolic cookers above 1.0 sqm of aperture area. Evaluators are working on two extreme levels at present. Solar parabolic cookers like SK-14 for domestic cookers and Scheffler concentrating systems for steam cooking for communities. One has to realize that there is huge market and potential for deployment of mid sized solar cookers which can cook for around 50 people. Our experiences with solar dish cookers of 4 sqm are very encouraging. These can be deployed for Schools, hospitals, Old age homes and many charitable and holy organizations where community cooking is practiced. I feel potential in India is for more than 300000 such cooking systems which can feed 15 million people. These systems may also be included in the scope. I think we need to work at three levels, domestic solar cookers for single families, small community solar cookers and large community systems like steam systems. A photograph of PRINCE-40 solar dish cooker for 40-50 people is attached herewith.



- b. In country like India, cost is one of the most driving factors. At present fossil fuels like kerosene and LPG are highly subsidized by governments and firewood is almost free. This is big hurdle in promoting solar cooking as savings are not substantial. However oil prices are going up and government is serious in revising the subsidy structure and these new policies will indirectly support any alternate technology. Personally I do not think training is an issue. Almost all solar cookers are so easy to operate; we did not face any such queries from any sectors. It is important to demonstrate the technology to prospective user group to gain their confidence, but major driving factor for long term use of solar cookers can only be the high cost of existing fuel. Better taste, high nutrition value and

mythological references to quality and medicinal values of solar cooking are other driving factors in India.

- c. Lifetime of solar cooker technologies: For the cookers which are constructed in non biodegradable materials like steel, aluminum, rockwool insulation and glass life is observed to be more than 5 years, which is reasonable. There are box cookers with life of more than 10 years and similarly we have noticed reflector life of 10 years for parabolic cookers and still going well. Reflector life normally depends on climate and pollution levels. We have noticed that reflector life in coastal region and in industrialized regions with high pollution levels is much lower than other non industrialized and dry regions. In general all technologies with life of above 5 years can be included in the project.
- d. There are hardly any cases where electricity is replaced by solar cooking. This possibility need not be taken in to account.
- e. Methodology should have both the options, based on fuel saving (Can be carried out using KPT, Kitchen Performance Tests) and also on operating hours. There are many efforts by NGOs and other promoters to use the solar cookers as a means of micro-enterprise. In India, from 11.00 a.m. to 4.00 p.m. the solar cookers are idle (Lunch is cooked before 11.00 a.m. and dinner after 4.00 p.m.) and in fact this is the time when radiation levels are excellent. Efforts are made by many organizations to use this time for livelihood generation to prepare snacks, candles etc. This will result in additional fuel saving. This approach is required, especially for small community cookers where one person can make a day's wage using the cooker in idle time.
Methodologies need to be regional in nature. In India, people eat lot of boiled meals in South and will have much higher utilization of solar cookers than people in North India where people eat 'Roti'.
- f. Measuring fuel consumptions before and after use of solar cookers, for selected sample cases, is the best method for monitoring. May be required in two seasons.
- g. Self reporting by the user is the option for estimating fuel savings. Use of temperature sensing devices is not done to monitor usage hours. Power ratings are reasonably reliable, but are climate dependent. However not much of significance can be attached to power rating to determine fuel saving potential.
- h. Fuel saving primarily depends on the cooking practices, recipes and other social and cultural issues. Regional groups should be made to determine the fuel saving potential. Our experiences from feed backs of the users of parabolic solar cookers are; 30 to 50% saving in regions where 'Roti' is a part of the meal and 30 to 60% in south India where 'Roti' is not a part of the meal. Utilisation is high where rice and fish are main meal constituents. For small community cookers the fuel replacement reported is 30 to 60% in most of the cases.
- i. Cross effects as mentioned are not significant and may not be taken in to account.